Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

July 22, 2011

Mr. Dwight Leisle
Port of Portland
7200 NE Airport Way
Portland, Oregon 97218

Re: Proposed Surface Soil Sampling — Former Wharf Road Area
Willamette Cove Upland Facility
Portland, Oregon
ECSI No. 271
1056-02

Dear Mr. Leisle:

This letter presents the proposed surface soil sampling activities to support the preparation of the Source Control Evaluation (SCE) for the Willamette Cove Upland Facility (the Facility; Figure 1) in the St. Johns area of Portland, Oregon. Work at the Facility is being conducted under Voluntary Agreement EC-NWR-00-26 between the Port of Portland (Port), Metro, and the Oregon Department of Environmental Quality (DEQ).

The DEQ issued a DRAFT comment letter dated September 28, 2009 indicating that additional investigation was necessary to complete the SCE. The *Source Control Sampling Work Plan* was submitted on March 31, 2010. The DEQ issued additional comment letters (dated January 15, February 3, May 7, and July 30, 2010). The Port submitted a *Source Control Sampling Work Plan Addendum* dated September 12, 2010, and implemented the Work Plan in the fall of 2010. The Port submitted a *2010 Source Control Sampling Results* data report on May 6, 2011.

The DEQ has requested further characterization of the dioxin/furans in surface soil in the former Wharf Road area (composite sample WC-1/2/3 and discrete follow-up samples WC-1, -2, and -3; Table 1) based on the results of the fall 2010 sampling. The scope of the sampling proposed in this letter is consistent with the approach proposed by Port and Metro in the meeting conducted with the DEQ on June 23, 2011. The proposed activities include collection of surface soil samples for chemical analysis.

BACKGROUND

Sampling of erodible soil in the former Wharf Road area was initially requested in response to the DEQ's concerns that the riverbank armoring was incomplete. Following field observations for exposed soil, the DEQ indicated that erodible soils were not easily accessible due to thick and continuous armor cover. As an alternative, the DEQ requested that surface soil from the heavily vegetated bench area above the ordinary line of high water (OLHW) be sampled in the footprint of the historical Wharf Road. Shallow surface samples (WC-1 through WC-3; Figure 3) were collected following removal of the vegetated cover. A three-point composite surface soil sample (WC-1/2/3) was collected and discrete samples from each sub-sample location were collected and retained.

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The chemical analyses included total petroleum hydrocarbon (TPH) hydrocarbon identification (HCID) by Northwest Method NWTPH-HCID, Priority Pollutant 13 Metals, polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270-SIM, polychlorinated biphenyls (PCBs) by EPA Method 8082, dioxins/furans by EPA Method 8290, and butyl tins (Krones Method). A follow-up analysis for diesel- and oil-range TPH by Northwest Method NWTPH-Dx (with silica gel cleanup) was completed on the composite sample. Additional follow-up analyses for metals and dioxins/furans were completed on the discrete samples due to exceedances of screening level values (SLVs) from the Joint Source Control Strategy (JSCS) guidance document (DEQ/EPA 2005; screening criteria revised July 16, 2007). PCBs, PAHs, and butyl tin concentrations in the composite sample were below the method reporting limits (MRLs) and/or below the applicable screening values.

PROPOSED SAMPLING ACTIVITIES

Preparatory Activities

The following activities and schedule coordination will be completed in preparation for the field work.

- Health and Safety Plan (HASP). Ash Creek Associates (Ash Creek) will update the HASP for its personnel involved with the project.
- Coordination of Facility Access. The work activities will be conducted in coordination with Metro.

Surface Soil Sampling

Three discrete surface soil samples will be collected to assess the extent of dioxin/furans (Figure 3). Two samples will be collected laterally and one toward the top of the riverbank slope. A sample will not be collected down the riverbank slope as that area is covered by thick armoring. As per DEQ's request, the proposed sample locations were overlaid on a historical aerial photograph to confirm that the proposed lateral sample locations are outside the footprint of the historical Wharf Road (Figure 3).

Surface soil will be collected from a depth of 0 to 6 inches after removing vegetated cover (as necessary). The samples will be collected in accordance with Standard Operating Procedure (SOP) 2.2 (Attachment A). The samples will be field screened for volatile organic compounds (VOCs) using a photoionization detector (PID) and for the presence of petroleum hydrocarbons using a sheen test in accordance with SOP 2.1.

The sample locations will be recorded using a high-accuracy, handheld global positioning system (GPS) device (Trimble© GeoXH™).

CHEMICAL ANALYSES

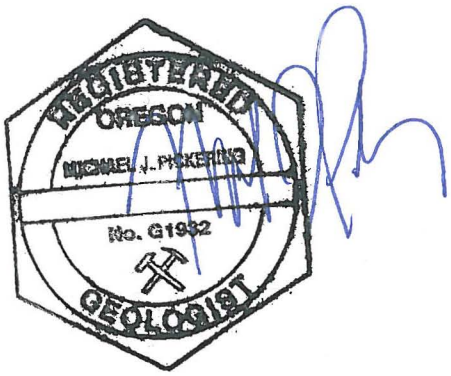
The chemical constituents detected above the JSCS SLVs in the former Wharf Road Area surface samples were metals and dioxins/furans (Table 1). The reported metals results were within the detected range of concentrations for samples collected along the extent of the riverbank at the Facility in 2010. The dioxin/furan results were elevated relative to the conservative JSCS SLVs. Consequently, the soil samples will be submitted for chemical analyses on a normal turnaround basis for dioxins/furans by EPA Method 8290. The requested method reporting limits (MRLs) will be consistent with the laboratory analyses completed in fall 2010.

REPORTING

The results of the sampling proposed in this letter will be discussed with the DEQ. If necessary, additional sampling to complete the characterization of the dioxin/furans in the former Wharf Road area will be recommended. The final results will be presented in a letter report.

If you have any questions regarding these activities, please contact the undersigned at (503) 924-4704.

Sincerely,

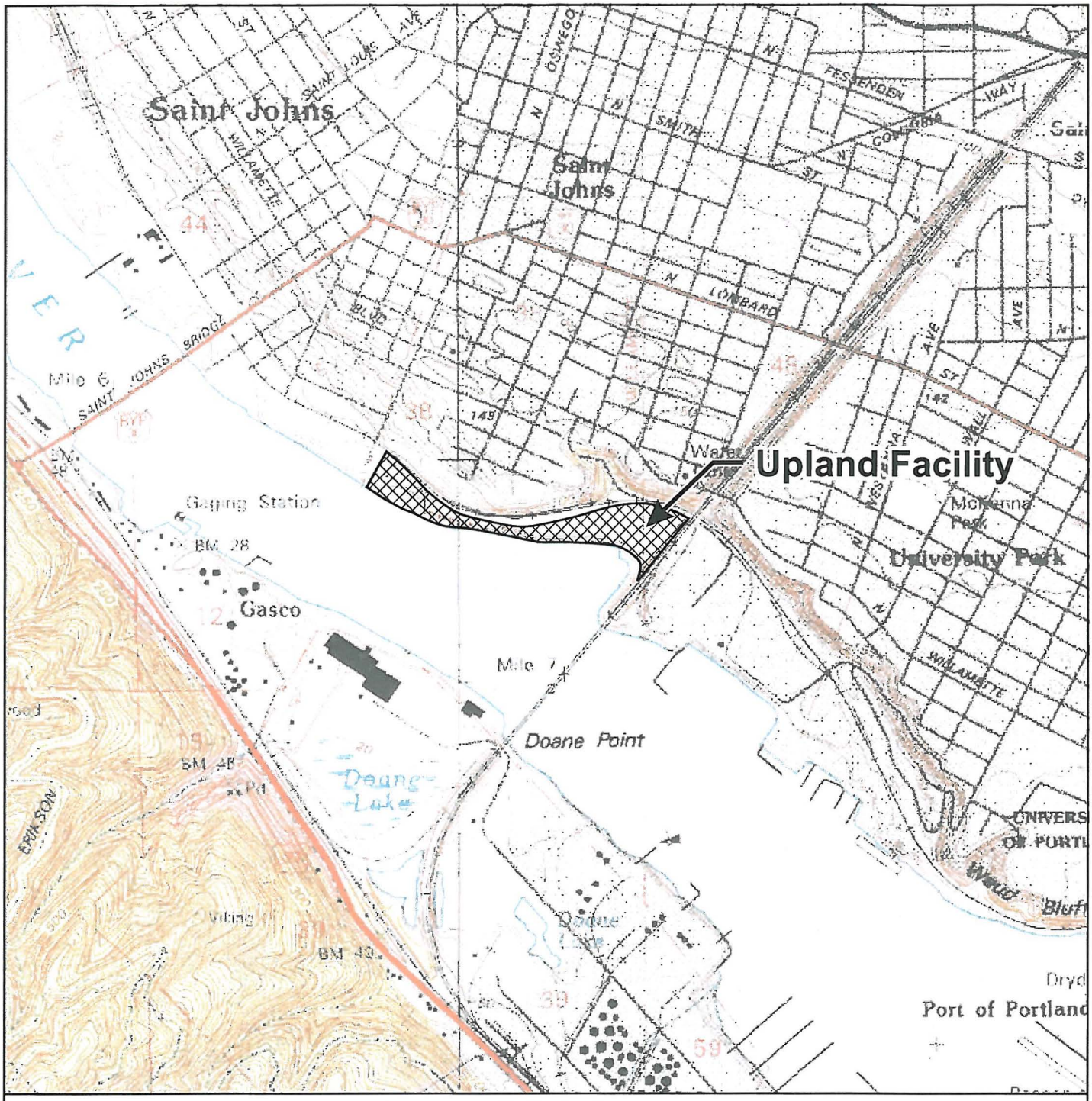


Michael J. Pickering, R.G.
Associate Hydrogeologist

ATTACHMENTS

Figure 1 – Facility Location Map
Figure 2 – Upland Facility Map
Figure 3 – Former Wharf Road Area Explorations

Attachment A – Standard Operating Procedures 2.1 and 2.2



Base map prepared from USGS 7.5-minute quadrangles as provided by TerraServer.

0 2,000 4,000

Approximate Scale in Feet

Facility Location Map

Proposed Surface Soil Sampling Letter
Port of Portland / Metro
Willamette Cove Upland Facility - Portland, Oregon

Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	Project Number 1056-02	Figure 1
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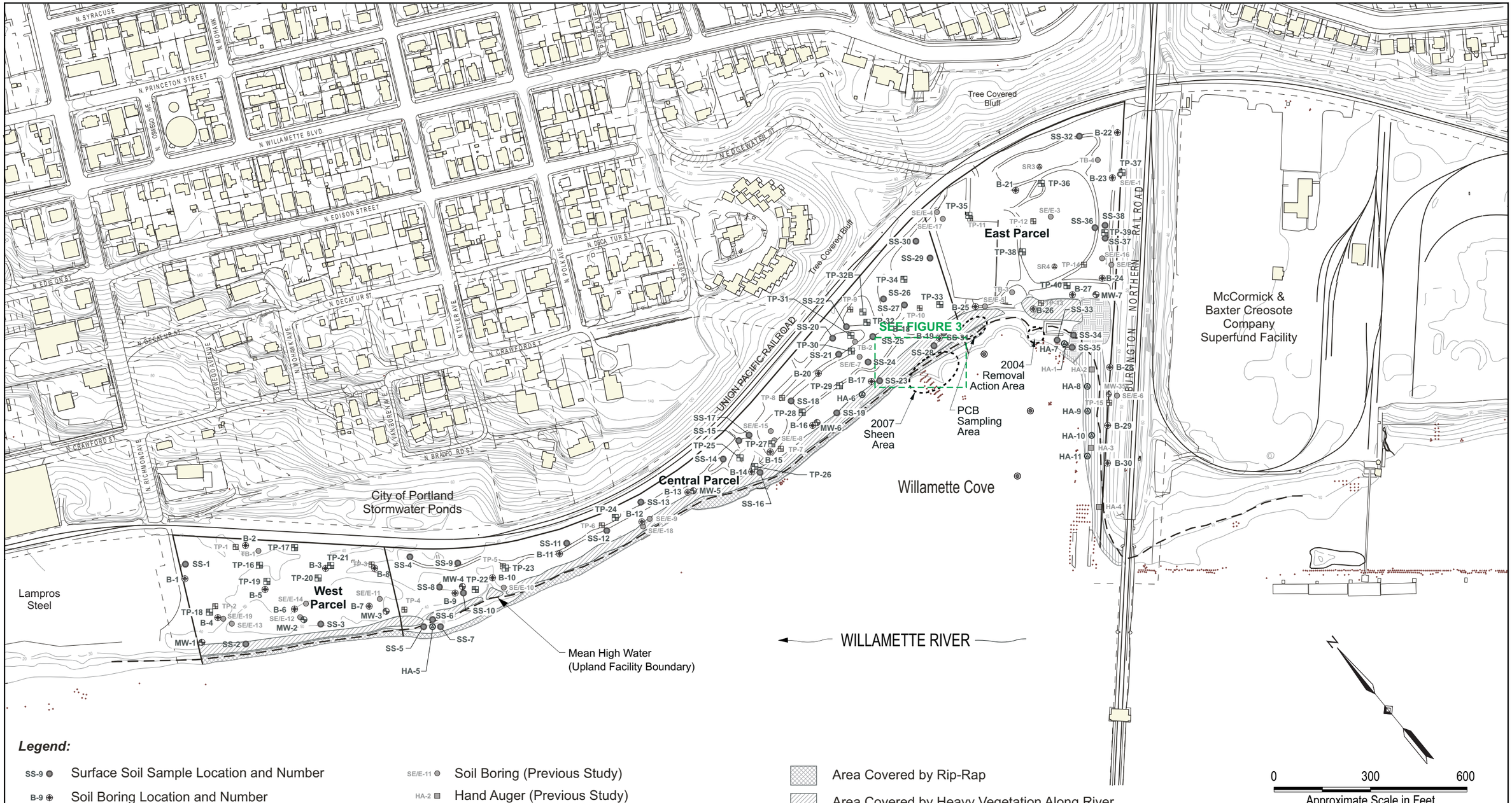

Legend:

- SS-9 — Surface Soil Sample Location and Number
- B-9 — Soil Boring Location and Number
- HA-5 — Hand Auger Soil Boring Location and Number
- TP-24 — Test Pit Location and Number
- MW-5 — Monitoring Well Location and Number
- Sediment Sample Location
- SE/E-11 — Soil Boring (Previous Study)
- HA-2 — Hand Auger (Previous Study)
- TP-4 — Test Pit (Previous Study)
- SR4 — Surface Soil Sample (Previous Study)
- MW-35s — Monitoring Well Location and Number (Previous Study)
- Area Covered by Rip-Rap
- Area Covered by Heavy Vegetation Along River
- Area Covered by Clean Imported Sand
- Area of Armored Sediment Cap

Note: Base map prepared from an electronic file provided by Hart Crowser.

Upland Facility Plan

Proposed Surface Soil Sampling Letter
Port of Portland / Metro
Willamette Cove Upland Facility - Portland, Oregon

Ash Creek Associates, Inc.
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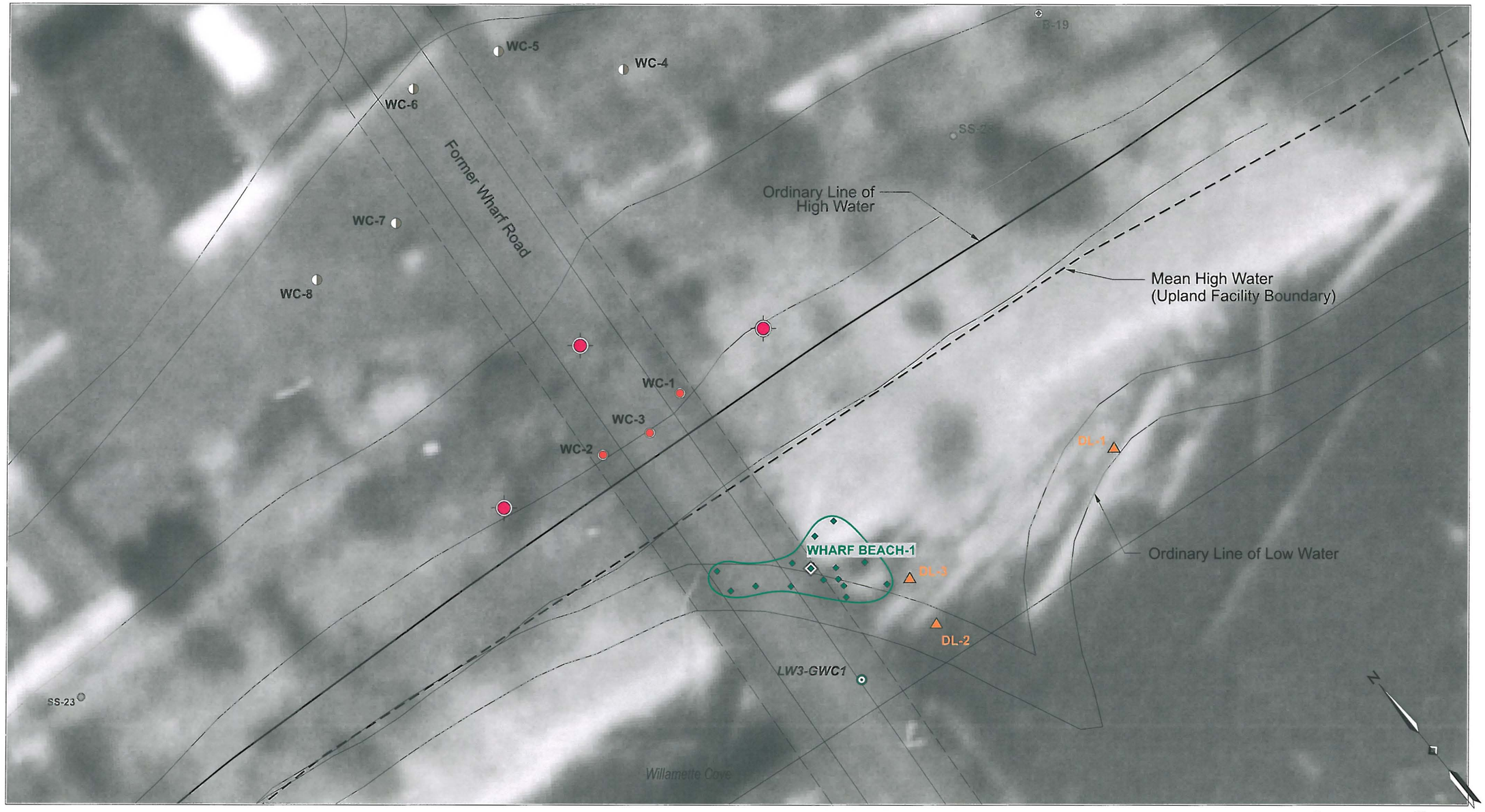
Figure 2



Legend:

- SS-9 — Surface Soil Sample Location and Number
- B-9 — Soil Boring Location and Number
- *LW3-GWC1* — LWG Sample Location
- DL-1 — Beach Sediment Sample (September 2007)
- Shovel Pit Exploration Locations
- WHARF BEACH-1 — Shovel Pit Sample Location
- WC-4 — Push-Probe Sample Location (2010)
- WC-1 — Surface Soil Sample Location (2010)
- Proposed Surface Soil Sample Location

Note: Base map prepared from an electronic file provided by Hart Crowser and a USACE 1961 aerial photograph.

Former Wharf Road Area Explorations

Proposed Surface Soil Sampling Letter
Port of Portland / Metro
Willamette Cove Upland Facility - Portland, Oregon

Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	Project Number 1056-02	Figure 3
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Attachment A

Standard Operating Procedures 2.1 and 2.2

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides instructions for standard field screening. Field screening results are used to aid in the selection of soil samples for chemical analysis. This procedure is applicable during all Ash Creek Associates (ACA) soil sampling operations.

Standard field screening techniques include the use of a photoionization detector (PID) to assess for volatile organic compounds (VOCs), for the presence of separate-phase petroleum hydrocarbons using a sheen test. These methods will not detect all potential contaminants, so selection of screening techniques shall be based on an understanding of the site history. The PID is not compound or concentration-specific, but it can provide a qualitative indication of the presence of VOCs. PID measurements are affected by other field parameters such as temperature and soil moisture. Other field screening methods, such as screening for dense non-aqueous phase liquid (DNAPL) using dye or UV light, are not considered "standard" and will be detailed in the site-specific sampling and analysis plan (SAP).

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- PID with calibration gas (record daily calibration/calibration check in field notes);
- Plastic resealable bags (for PID measurement); and
- Glass jars or stainless steel bowls (for sheen testing).

3. METHODOLOGY

Each soil sample will be field screened for VOCs using a PID and for the presence of separate-phase petroleum hydrocarbons using a sheen test. If the presence of DNAPL is suspected, then screening using dye and UV light may also to be completed. For information regarding screening using dye or UV light, refer to the site specific sampling and analysis plan.

PID lamps come in multiple sizes, typically 9.8, 10.6, and 11.7 electron volts (eV). The eV rating for the lamp must be greater than the ionization potential (in eV) of a compound in order for the PID to detect the compound. For petroleum hydrocarbons, a lamp of at least 9.8 eV should be used. For typical chlorinated alkenes (dichloroethene, trichloroethene, tetrachloroethene, or vinyl chloride.), a lamp of at least 10.6 eV should be used. The compatibility of the lamp size with the site constituents should be verified prior to the field event and will be detailed in the site-specific SAP.

PID Calibration Procedure: The PID used on-site should be calibrated daily or more frequently if needed. Calibration of the PID should be documented in field notes. Calibrations procedures should be conducted according to the manufacturer's instructions. .

<u>PID Screening Procedure:</u>

- Place a representative portion (approximately one ounce) of freshly exposed, uncompacted soil into a clean resealable plastic bag.
- Seal the bag and break up the soil to expose vapors from the soil matrix.
- Allow the bag to sit to reach ambient temperature. Note: Ambient temperature and weather conditions/humidity should be recorded in field notes. Changes in ambient temperature and weather during the field work should also be recorded, as temperature and humidity can affect PID readings.
- Carefully insert the intake port of the PID into the plastic bag.
- Record the PID measurement in the field notes or boring logs.

<u>Sheen Test Procedure:</u>

- Following the PID screen, place approximately one ounce of freshly exposed, uncompacted soil into a clean glass jar or stainless steel bowl.

- Add enough water to cover the sample.
- Observe the water surface for signs of discoloration/sheen and characterize

No Sheen (NS)	No visible sheen on the water surface
Biogenic Film (BF)	Dull, platy/blocky or foamy film.
Slight Sheen (SS)	Light sheen with irregular spread, not rapid. May have small spots of color/iridescence. Majority of water surface not covered by sheen.
Moderate Sheen (MS)	Medium to heavy coverage, some color/iridescence, spread is irregular to flowing. Sheen covering a large portion of water surface.
Heavy Sheen (HS)	Heavy sheen coverage with color/iridescence, spread is rapid, entire water surface covered with sheen. Separate-phase hydrocarbons may be evident during sheen test.

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods used for obtaining surface soil samples for physical and/or chemical analysis. For purposes of this SOP, surface soil (including shallow subsurface soil) is loosely defined as soil that is present within 3 feet of the ground surface at the time of sampling. Various types of sampling equipment are used to collect surface soil samples including spoons, scoops, trowels, shovels, and hand augers.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Spoons, scoops, trowels, shovels, and/or hand augers. Stainless steel is preferred.
- Stainless steel bowls
- Laboratory-supplied sample containers
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by Health and Safety Plan)

3. METHODOLOGY

Project-specific requirements will generally dictate the preferred type of sampling equipment used at a particular site. The following parameters should be considered: sampling depth, soil density, soil moisture, use of analyses (e.g., chemical versus physical testing), type of analyses (e.g., volatile versus non-volatile). Analytical testing requirements will indicate sample volume requirements that also will influence the selection of the appropriate type of sampling tool. The project sampling plan should define the specific requirements for collection of surface soil samples at a particular site.

Collection of Samples

- Volatile Analyses. Surface soil sampling for volatile organics analysis (VOA) is different than other routine physical or chemical testing because of the potential loss of volatiles during sampling. To limit volatile loss, the soil sample must be obtained as quickly and as directly as possible. If a VOA sample is to collected as part of a multiple analyte sample, the VOA sample portion will be obtained first. The VOA sample should be obtained from a discrete portion of the entire collected sample and should not be composited or homogenized. Sample bottles should be filled to capacity, with no headspace. Specific procedures for collecting VOA samples using the EPA Method 5035 are discussed in SOP 2-7.
- Other Analyses. Once the targeted sample interval has been collected, the soil sample will be thoroughly homogenized in a stainless steel bowl prior to bottling. Sample homogenizing is accomplished by manually mixing the entire soil sample in the stainless steel bowl with the sampling tool or with a clean teaspoon or spatula until a uniform mixture is achieved. If packing of the samples into the bottles is necessary, a clean stainless steel teaspoon or spatula may be used.

General Sampling Procedure:

- Decontaminate sampling equipment in accordance with the Sampling and Analysis Plan (SAP) before and after each individual soil sample.
- Remove surface debris that blocks access to the actual soil surface or loosen dense surface soils, such as those encountered in heavy traffic areas. If sampling equipment is used to remove surface debris,

the equipment should be decontaminated prior to sampling to reduce the potential for sample interferences.

- When using a hand auger, push and rotate downward until the auger becomes filled with soil. Usually a 6- to 12-inch long core of soil is obtained each time the auger is inserted. Once filled, remove the auger from the ground and empty into a stainless steel bowl. If a VOA sample is required, the sample should be taken directly from the auger using a teaspoon or spatula and/or directly filling the sample container from the auger. Repeat the augering process until the desired sample interval has been augered and placed into the stainless steel bowl.

Backfilling Sample Locations:

Backfill in accordance with federal and state regulations including OAR 690-240 (e.g., bentonite requirements). The soils from the excavation will be used as backfill unless project-specific or state requirements include the use of clean backfill material.